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54 An exercise machine.

57 An exercise machine has a body (1) of monocoque construction formed by two identical shells (2,3) secured together in mirror image fashion. Further identical mouldings provide stabilising feet (9,10) which help keep the shells together, and saddle and handlebar assemblies (12,14;13) are fitted in sockets formed by the shells and held in selected positions by cam clamps (20). The user operates pedals (28) on co-axial moulded discs (26) on opposite sides of the body joined by a shaft (29) which is coupled to energy absorbing means concealed within the body or behind the discs. These include a fan (38) whose air flow can be used to operate an indicator of the effort expended and as a cooling draught over the user. There may also be a centrifugal braking device (49,52), and a timer (54) on the handlebar assembly (13).

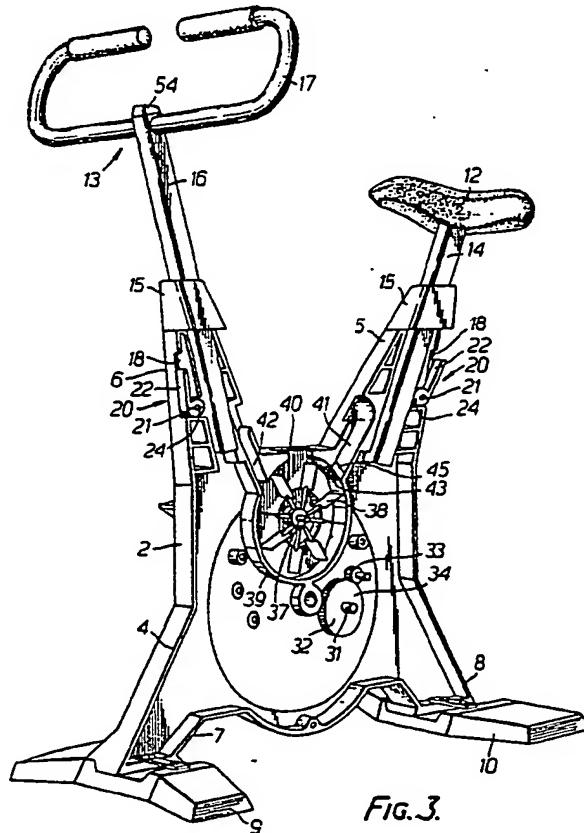


FIG. 3.

### An Exercise Machine

This invention relates to exercise machines and is primarily concerned with those known as exercise cycles. These bear a resemblance to an ordinary cycle in that they are pedal operated and have a saddle and handlebars, but instead of having wheels they are on a static frame and the effort expended is usually absorbed by a friction device.

It is conventional for these machines to have some constructional similarity to ordinary cycles, with a framework of metal tube welded or brazed together. This is expensive and time consuming to produce, as well as often looking cumbersome and inelegant.

Also, the friction device simply generates heat and does nothing particularly useful beyond providing a resistance against which the user must work.

It is the aim of this invention to have a more streamlined and more easily constructed and assembled body, and preferably to put the user's work to some purpose beyond the exercise.

According to one aspect of the present invention there is provided an exercise machine adapted to carry the user and having a body of monocoque construction providing a cavity containing means for offering resistance to effort applied externally of the body.

Thus, the machine will have a smooth and simple appearance, with most of the operating parts concealed within the body.

In the preferred form, the resistance means includes a fan, and air flow from this may be arranged to operate an indicator which will show the effort being expended on the machine. Also there may be means for directing air flow from the fan over the user of the machine.

Conveniently, the body is formed by identical moulded shells secured together in mirror-image fashion. There may also be a separately moulded stabilising base for the body, whose co-operation with the body shells assists in holding the latter together. This base may comprise two separate feet at opposite ends.

The machine will generally be in the form of an exercise cycle, in which case there may be two identical discs with projecting pedals co-axially carried on opposite sides of the body by a rotary shaft coupled to the resistance means within. The body may provide sockets to receive a saddle assembly and a handlebar assembly, each being adjustably held by a cam locking device. Preferably these sockets are formed in upstanding portions at opposite ends of the body, the indicator being mounted over the mouth of the duct in one portion (to receive the handlebar assembly) on the side facing

the other portion (to receive the saddle assembly). Thus someone seated on the saddle and looking forwards and downwards has the indicator in easy view. The corresponding duct in the other portion may be adapted to serve as a tool locker and/or to receive means for scenting the air entrained by the fan.

Timing means may be mounted on the handlebar assembly for the user to gauge the length of his exercise.

The resistance means may further include a centrifugal braking device.

For a better understanding of the invention one embodiment will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of an exercise cycle.

Figure 2 is a perspective view of the cycle with a flywheel removed.

Figure 3 is a perspective view of the cycle with the near side removed.

Figure 4 is a perspective view of the inside of a drive disc or flywheel,

Figure 5 is a face view of an ergometer that can be fitted to the cycle, and

Figure 6 is a face view of a centrifugal braking device that can be fitted to the cycle.

The cycle has a main body 1 made up from two identical shells 2 and 3. These are secured together mirror image fashion, their interface line being indicated at 4, so that effectively the body is of monocoque construction. The material used will preferably be a polyester glass reinforced moulding compound, often referred to as dough moulding compound.

The lateral appearance of the body is polygonal, the main features being two upstanding and slightly divergent projections 5 and 6 at the top, and somewhat stubbier projections 7 and 8 at the bottom. The latter co-operate with a base provided by two stabilising feet 9 and 10, these being identical mouldings of the same material as the body shells. In plan, they are shallow V-shaped and in use they are positioned with their apices towards each other. Over their central portions they are of reduced thickness to provide a flared channel in which seats a correspondingly shaped central rib 11 on the underside of the associated projection 7 or 8. The seating of this rib 11 wedges the two shells 2 and 3 together in this region and assists in holding the body together. This wedging action may alone be sufficient to retain the feet, but generally they will be further secured by screws

entered from underneath. It will be understood that a single base moulding may be used instead, or the shells 2 and 3 may be formed with suitable stabilizing projections. However, the latter would make them rather large and awkward to package.

The projections 5 and 6 provide sockets for mounting a saddle 12 and a handlebar assembly 13. The saddle 12 itself may be of conventional form, as shown, and it is mounted at the top of a rectangular section stem 14 which slots into the socket in the projection 5. It can be clamped at any desired height within the scope of the stem 14 by an arrangement identical to that for the handlebar assembly to be described below. Where the stem 14 enters the projection 5, it is surrounded by a rubber or plastics skirt 15 which is partly cosmetic but also protects and guards against pinched fingers.

The handlebar assembly 13 has a stem 16 of similar cross-section to the stem 14 and slots into the projection 6 through another skirt 15. The handlebar 17 itself is a tube formed almost into a rectangle with rounded corners and secured to the top of the stem 16 at the centre of its longer complete side. The assembly 13 can be removed and turned from the position shown through 180° about the axis of the stem 16 so that the handlebar 17 inclines away from a user on the saddle 12.

This assembly and the saddle are infinitely adjustable for height, as best seen from Figure 3. The projections 5 and 6 have recesses 18 in the flanges which will form the forward and rear edges of the body and these, when brought together, each accommodate a cam clamping or locking device 20. This is a generally L-shaped member pivoted on a bolt 21 which also serves to hold the shells 2 and 3 together in this region. The longer leg 22 of the member 19 can be set flush with the face of the body, leaving a finger hole 23 at the upper end. In this position, the rounded end of the shorter leg 24 projects slightly into the stem receiving socket to produce a clamping action. The end contour of the leg 24 forms a cam and its relationship to the axis of the bolt 21 on which it pivots is such that the clamping action is "over centre" and cannot be self-releasing. However, when the leg 22 is pulled, the shorter leg 24 can be snapped out of engagement and the stem released for adjustment of the saddle or handlebar.

On each side of the body 1 the shells 2 and 3 have circular recesses 25 partially to house discs or flywheels 26, also moulded from the same material as the shells and feet. Externally, they are each provided with a socket 27 for mounting a pedal 28. The discs are on a common axle 29 and the one on the invisible side of the shell 2 as Figures 1 to 3 are viewed has an annular gear ring 30 secured co-axially to its inner side. Within the

5 associated recess 25, it drives a small gear (not shown) on a shaft 31 which carries a larger gear 32 on the inside of the body 1. This gear 32 meshes with a pinion 33 on a shaft 34 which extends through the shell 3 into the latter's recess 25. As shown in Figure 3, a toothed belt pulley 35 on this shaft transmits drive via a smaller pulley 36 to a shaft 37. There is a continuous step-up throughout this transmission, so that the shaft 37 will rotate at many times the speed of the discs 26.

10 The shaft 37 carries a fan 38 within a circular housing 39 formed by the shells 2 and 3. Air will be drawn into this housing first between the peripheries of the discs 26 and the shells 2 and 3 and then through the arcuate apertures visible in Figure 2. It is expelled through a grille 40 in the narrow upwardly facing portion of the body between the upper projections 5 and 6.

15 There may be means for closing or at least restricting this grille, thus increasing the resistance. But when open to any degree, there will be a strong draught of air flowing upwards from it, which will serve to cool the user.

20 Ducts 41 and 42 lead from the housing 39 to rectangular apertures in the opposed faces of the projections 5 and 6. The duct 41 in the projection 5 carrying the saddle 12 is closed at its lower end by a blanking off member 43 and may serve as a tool locker; a few keys, spanners and/or screwdrivers will normally be supplied to assist servicing. The rectangular aperture will then be closed by a removable cap 44. Alternatively, or in addition, the blanking off member 43 may be a fine mesh element supporting an air freshening or scenting block 45.

25 The duct 42, however, will be open at its lower end and a proportion of the air from the fan will be driven up it to operate an indicator of the work being expended. Such an indicator, which will fit in the rectangular mouth and be easily visible to the user, is shown diagrammatically in Figure 5. It consists of a calibrated window 46 behind which three parallel channels 47 lead upwards. Each contains a differently coloured slug 48 and when the cycle is not in use, these rest on stops at the bottom of each channel, although air from the duct 42 will have access to each. They may be of different mass, and/or the gap for such air access will be different for each channel. In any event, the effect will be that as air flow is increased, first one slug 48 will be forced up its channel 47, then the second one, and finally the third one, at which stage the user will be working really hard.

30 Considerable effort will be expended in working the fan and, of course, overcoming a certain amount of friction in the transmission. However, this may not provide sufficient resistance, particularly at the higher levels of effort. Therefore, a

centrifugal braking system is provided, as shown in Figure 6. Within the recess 25 of the shell 2, to be clear of the gear ring 30, there is secured an annular friction member 49. The shaft 37 extends co-axially into this member and carries a diametral bar 50. At the ends of this are pivoted in symmetrical fashion two arms 51 with brake shoes 52 at their ends to co-operate with the inside of the member 49. They are normally restrained from doing this by an elastic band 53, but as speed increases the centrifugal effect prevails and the brake shoes engage progressively harder against the member 49.

To assist the user to regulate his exercise a timing device 54 may be provided, and conveniently this is mounted by plugging into the top of the stem 16 of the handlebar assembly 13, where a clock display and perhaps a warning light are easily visible. Provision may be made for the user to set a selected time and for the clock to count down from that.

## Claims

1. An exercise machine adapted to carry the user, characterised by a body (1) of monocoque construction providing a cavity containing means (38; 49,52) for offering resistance to effort applied externally of the body.
  2. A machine as claimed in Claim 1, characterised in that the resistance means includes a fan (38).
  3. A machine as claimed in Claim 2, characterised in that air flow from the fan (38) is arranged to operate an indicator (47, 48) which will show the effort being expended on the machine.
  4. A machine as claimed in Claim 2 or 3, characterised in that there are means (40) for directing air flow from the fan over the user of the machine.
  5. A machine as claimed in Claim 1, characterised in that the body (1) is formed by identical moulded shells (2,3) secured together in mirror-image fashion.
  6. A machine as claimed in Claim 5, characterised in that there is a separately moulded stabilising base (9,10) for the body whose co-operation with the body shells (2,3) assists in holding the latter together.
  7. A machine as claimed in Claim 1, characterised in that it is an exercise cycle, there being two identical moulded discs (26) with projecting pedals (28) co-axially carried on opposite sides of the body (1) by a rotary shaft (29) coupled to the resistance means (38; 49,52) within.

8. A machine as claimed in Claim 7, characterised in that the body (1) provides two sockets, a saddle assembly (12,14) being received by one and a handlebar assembly (13) by the other, each being adjustably held by a cam locking device (20).

9. A machine as claimed in Claim 8 as appended to Claim 3, characterised in that the sockets are formed in upstanding portions (5,6) at opposite ends of the body, the indicator (47,48) being mounted over the mouth of a duct (42) in one (6) of said portions (to receive the handlebar assembly) on the side facing the other portion (5) (to receive the saddle assembly).

10. A machine as claimed in Claim 9 as appended to Claim 5, characterised in that the corresponding duct (41) in the other portion (5) is adapted to serve as a tool locker and/or to receive means (45) for scenting the air entrained by the fan.

11. A machine as claimed in Claim 8, 9 or 10, characterised in that timing means (54) are mounted on said handlebar assembly (13).

12. A machine as claimed in Claim 1, characterised in that the resistance means further include a centrifugal braking device (49,52).

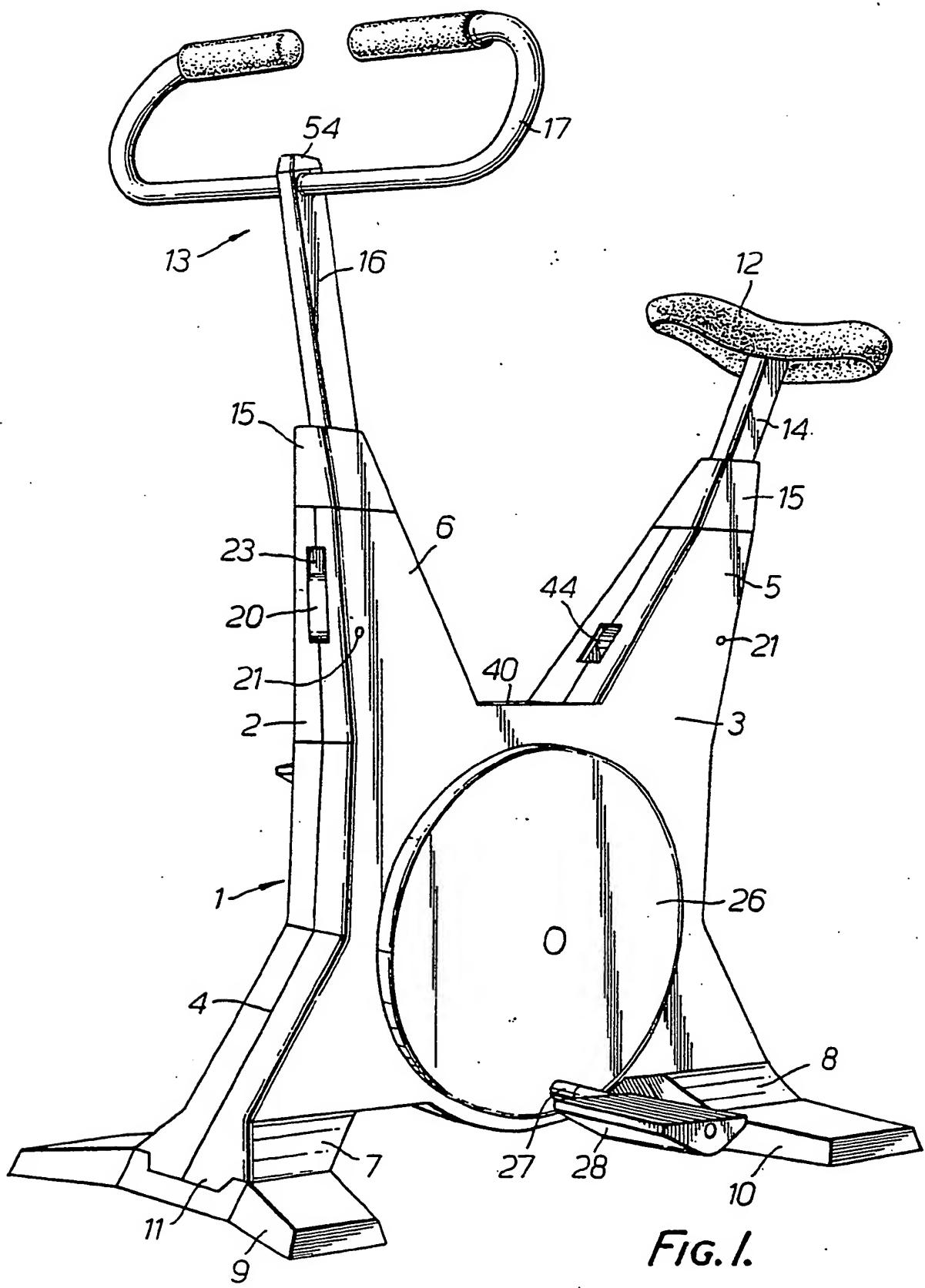


FIG. 1.

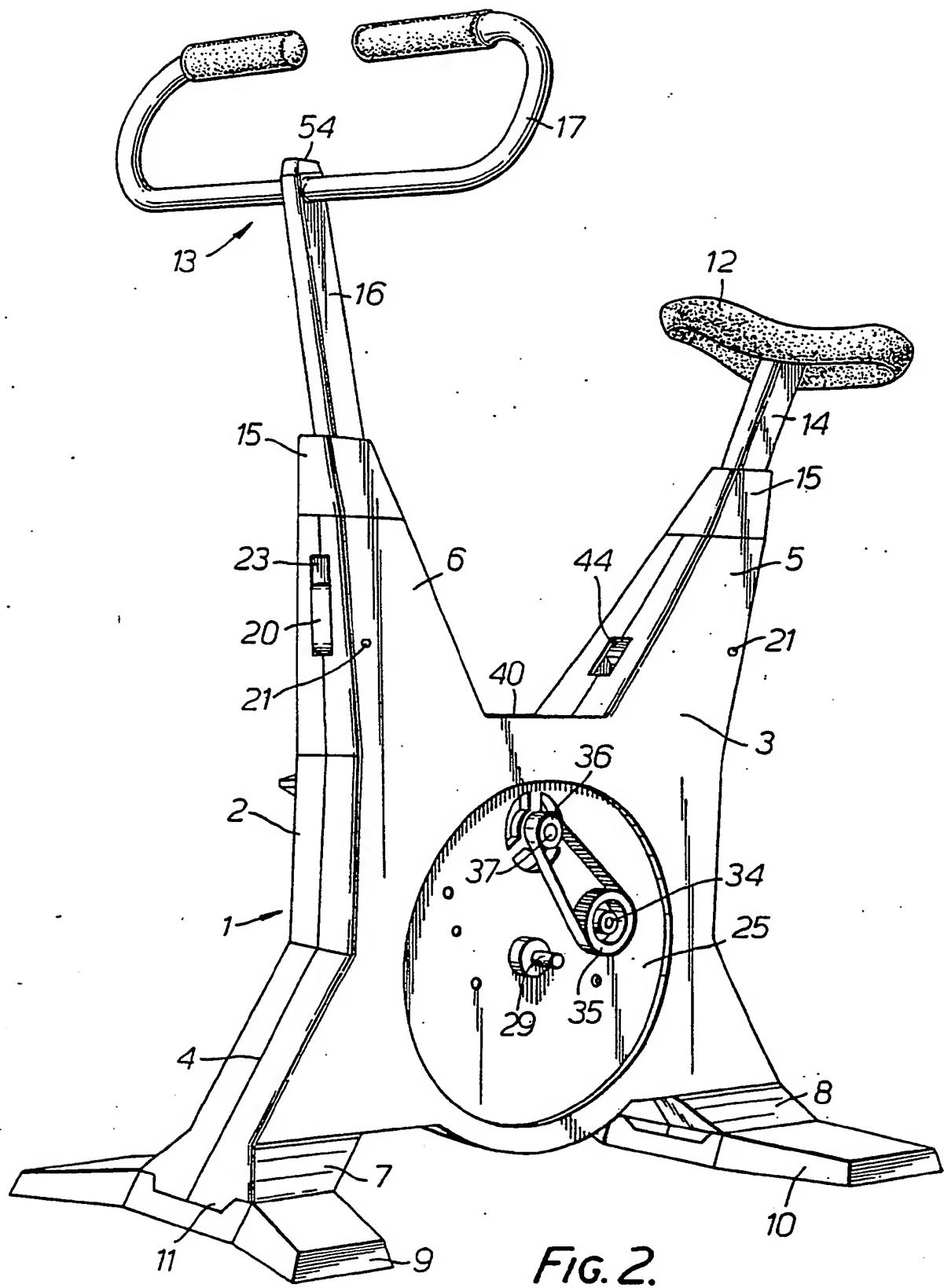
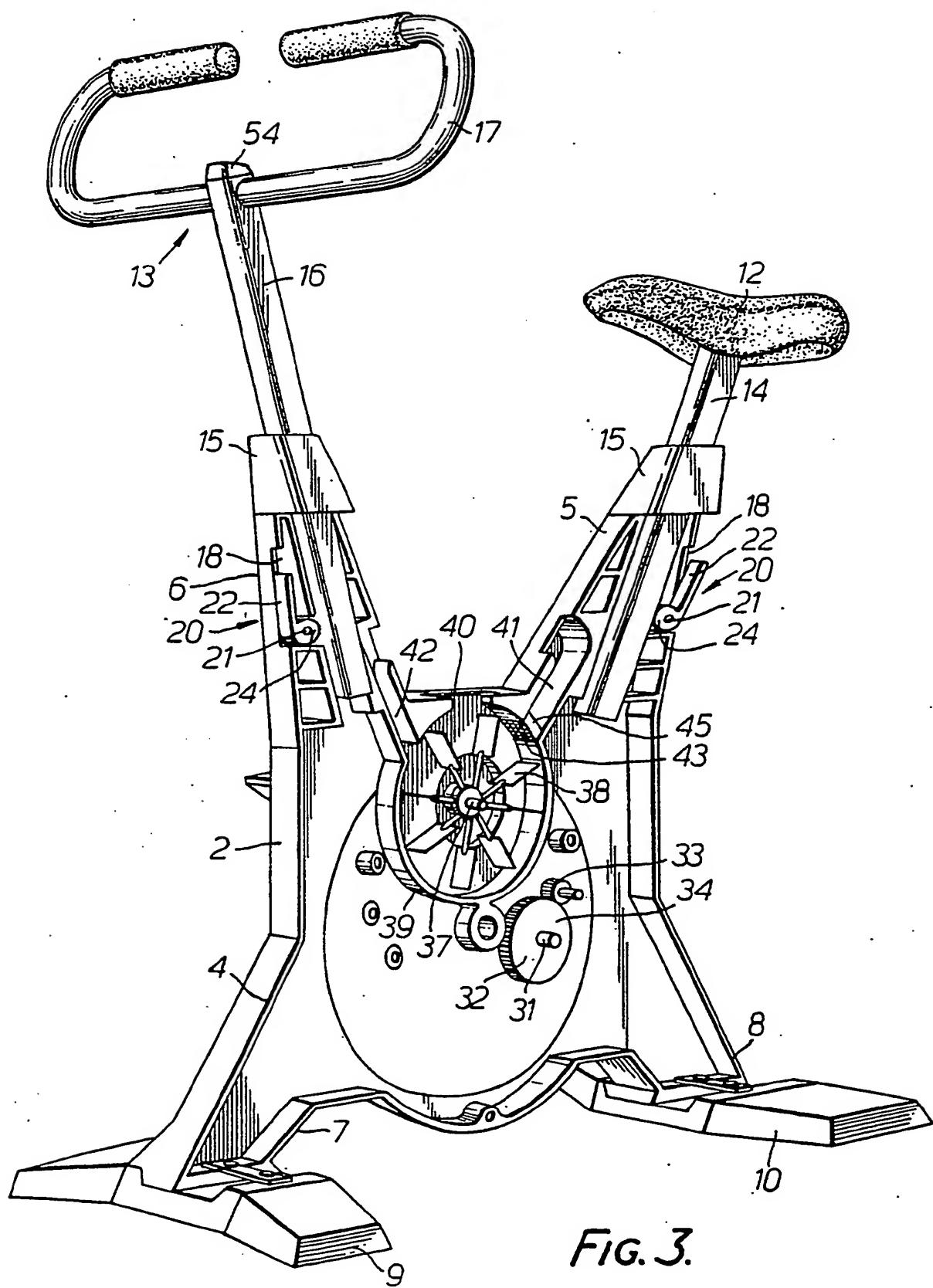


FIG. 2.



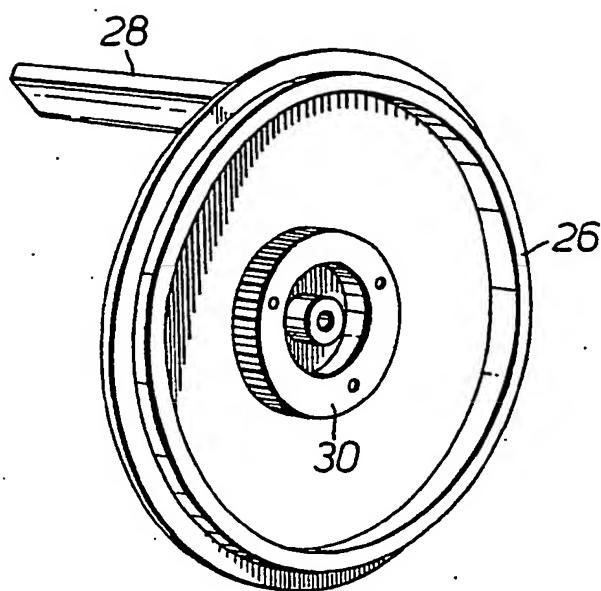


FIG. 4.

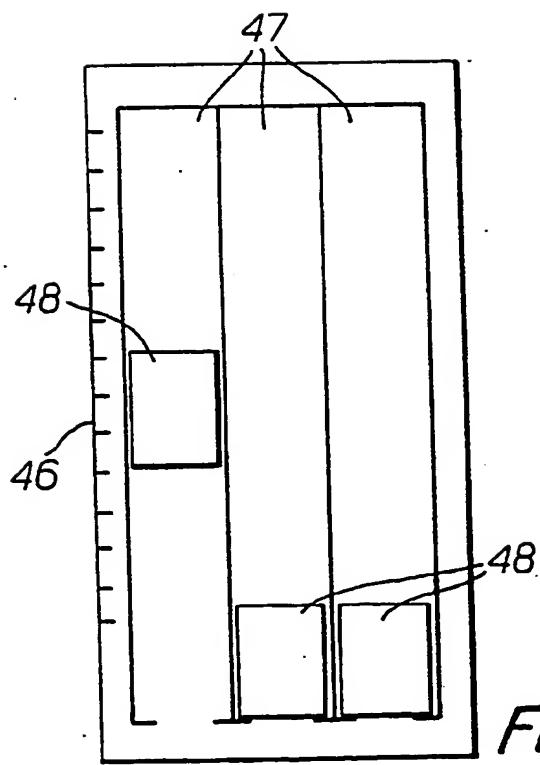


FIG. 5.

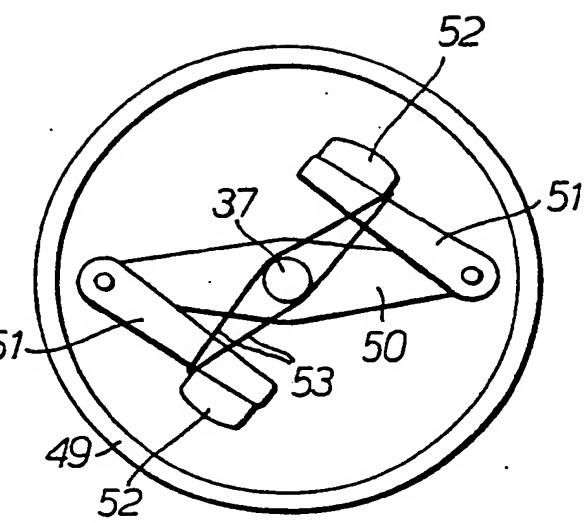


FIG. 6.



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EUROPEAN SEARCH REPORT

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EP 88 30 8535

| DOCUMENTS CONSIDERED TO BE RELEVANT   |  |                   | CLASSIFICATION OF THE APPLICATION (Int. Cl. 4) |  |  |
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| Category  | Citation of document with indication, where appropriate, of relevant passages      | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl. 4) |  |  |
| X   | EP-A-0 203 804 (REPCO LTD)<br>* claims 1, 2, 5-7, 10, 13, figures<br>1-4, 10, 11 * | 1-3, 7,           | A 63 B 23/04                                   |  |  |
| Y   | ---  | 4                 |  |  |  |
| A   | ---  | 9-12              |  |  |  |
| Y   | US-A-4 580 983 (CASSINI et al.)<br>* abstract, claim 1, figure 1 *                 | 4                 |  |  |  |
| A   | ---  |                   |  |  |  |
| X   | US-A-4 082 264 (SANTOS)<br>* claim 1, figures 1-5 *                                | 1-3, 7            |  |  |  |
| A   | ---  | 8, 9              |  |  |  |
| A   | EP-A-0 068 215 (NEUBAUER GMBH<br>MASCHINENBAU)<br>* claims 1, 2, 7, figure 1 *     | 5, 6              |  |  |  |
| X, P  | US-A-4 700 942 (DANCHULIS)<br>* claim 2, figure 1 *                                | 1                 |  |  |  |
| A   | -----  | 5, 6              |  |  |  |
|   |  |                   | TECHNICAL FIELDS<br>SEARCHED (Int. Cl. 4)      |  |  |
|   |  |                   | A 63 B 21/00                                   |  |  |
|   |  |                   | A 63 B 23/00                                   |  |  |
|   |  |                   | A 63 B 69/00                                   |  |  |
| The present search report has been drawn up for all claims  |  |                   |  |  |  |
| Place of search   | Date of completion of the search   | Examiner          |  |  |  |
| BERLIN  | 01-12-1988   | MICHELS N.        |  |  |  |
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